Attorney Docket No. 000730C1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: **Norman F. Krasner**	**For: METHOD AND APPARATUS FOR SIGNAL PROCESSING IN A SATELLITE POSITIONING SYSTEM**
Serial No.: 10/756,947	**Examiner: William D. Cumming**
Filed: January 13, 2004	**Group Art Unit: 2617**

APPEAL BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This Appeal Brief supports the appeal from the decision of the Examiner mailed on May 16, 2006, finally rejecting claims 1-84 of the above-identified patent application.

Real Party in Interest

QualComm Incorporated, as assignee of the above-identified patent application, (Reel/Frame 014900/0182), having an address of 5775 Morehouse Drive, San Diego, California 92121, is the real party in interest.

Related Appeals and Interferences

Neither Appellant nor Appellant's legal counsel know of any appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in the present appeal.

Status of Claims

Claims 1-84 are pending in this application. Claim 1, 16, 29, 43, 61, 68, and 75 are the pending independent claims at issue in this appeal.

This appeal is taken from the final rejection of claims 1-84. Appendix A presents the claims at issue in the appeal.

No claims are allowed.

Status of Amendments

No amendments after the final rejection have been submitted to, or entered by, the Examiner.

Summary of Claimed Subject Matter

The present application contains seven independent claims. Independent claim 1 is directed to a method for satellite positioning system (SPS) signal processing. The method of claim 1 comprises a combination of steps, including "receiving at an SPS receiver one or more SPS signals" that is described at paragraph 20 with reference to Fig. 1 (reference number 104), paragraph 55 with reference to Fig. 4 (404), and paragraph 66 with reference to Fig. 5 (504). The method of claim 1 also includes "removing pseudorandom noise from said one or

more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal" as described at paragraphs 21-22, 27-28, and 30 with reference to Figs. 1 (106) and 2A, paragraph 56 with reference to Fig. 4 (406), and paragraph 66 with reference to Fig. 5 (506). The method of claim 1 further includes "combining said first portion with common information in said second portion to improve the sensitivity of the SPS receiver" as described at paragraph 18, paragraphs 22-23 with reference to Figs. 1 (108) and 2A, paragraphs 57-60 with reference to Fig. 4 (408-418), and paragraphs 66-72 with reference to Fig 5 (508-520). Finally, the method of claim 1 states that "said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals" as described at paragraph 18, paragraphs 22-24 with reference to Fig. 1 (108), paragraphs 57-58 with reference to Fig. 4 (408-410), and paragraphs 65-66 and 68-70 with reference to Fig. 5 (512-516).

Independent claim 16 is directed to a method for processing a signal associated with a satellite positioning system. The method of claim 16 comprises a combination of steps, including "receiving at an SPS receiver a first SPS signal containing a satellite message associated with a satellite vehicle," and "receiving at said SPS receiver a second SPS signal containing said satellite message associated with said satellite vehicle" as described at paragraph 20 with reference to Fig. 1 (104), and paragraph 55 with reference to Fig. 4 (404), and paragraph 66 with reference to Fig. 5 (504). The method of Claim 16 goes on to require "removing pseudorandom noise from said first and second SPS signals to provide a first set of signal samples of a narrowband signal and a second set of signal samples of a narrowband signal" that is described at paragraphs 21-22, 27-28, and 30 with reference to Figs. 1 (106) and 2A, and paragraphs 56-59 with reference to Fig. 4 (406-412). Claim 16 further recites "combining common information in said first and second sets of signal samples to improve the sensitivity of the SPS receiver" that is described at paragraph 18, paragraph 20 with reference to Fig. 1 (104), and paragraph 58 with reference to Fig. 4 (410).

Finally, the method of claim 16 requires that "said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals" as described at paragraph 18, paragraphs 22-24 with reference to Fig. 1 (108), and paragraphs 57-58 with reference to Fig. 4 (408-410).

Independent claim 29 is directed to a method for satellite positioning system signal processing. The method of claim 29 comprises a combination of steps, including, "receiving at an SPS receiver a first SPS signal containing a first satellite message, said first satellite message associated with a first satellite vehicle" and "receiving at said SPS receiver a second SPS signal containing a second satellite message, said second satellite message associated with a second satellite vehicle" as described at paragraph 20 with reference to Fig. 1 (104), and paragraph 66 with reference to Fig. 5 (504). The method of Claim 29 goes on to require "removing pseudorandom noise from said first and second SPS signals to provide a first set of signal samples of a narrowband signal and a second set of signal samples of a narrowband signal" that is described at paragraphs 21-22, 27-28, and 30 with reference to Figs. 1 (106) and 2A, and paragraphs 66-68 with reference to Fig. 5 (506-512). Claim 29 further recites "combining common information in said first and second sets of signal samples to improve the sensitivity of the SPS receiver" that is described at paragraph 18, paragraph 20 with reference to Fig. 1 (104), and paragraphs 69-70 with reference to Fig. 5 (514-516). Finally, the method of claim 29 requires that "said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals" as described at paragraph 18, paragraphs 22-24 with reference to Fig. 1 (108), and paragraphs 65-66 and 68-70 with reference to Fig. 5 (512-516).

Independent claim 43 is directed to an apparatus to provide satellite positioning system (SPS) signal processing. The apparatus of claim 43 comprises a combination of elements, including "a despreader that removes pseudorandom

noise from one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal" as described at paragraph 21 with reference to Fig 1 (106), paragraph 56 with reference to Fig. 4 (406), paragraph 66 with reference to Fig. 5 (506), paragraph 74 with reference to Fig. 6 (612, 614), and paragraph 76 with reference to Fig. 7 (708). The apparatus of claim 43 also includes "a processor, coupled to said despreader, to combine common information in said first portion with said second portion to improve the sensitivity of the SPS receiver" as described at paragraph 18, paragraph 20 with reference to Fig. 1 (104), paragraphs 69-70 with reference to Fig. 5 (514-516), paragraph 74 with reference to Fig. 6 (612, 614), and paragraph 76 with reference to Fig. 7 (708). Finally, claim 43 states that "said common information comprising data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals" as described at paragraph 18, paragraphs 22-24 with reference to Fig. 1 (108), paragraphs 57-58 with reference to Fig. 4 (408-410), paragraphs 65-66 and 68-70 with reference to Fig. 5 (512-516), paragraph 74 with reference to Fig. 6 (612, 614), and paragraph 76 with reference to Fig. 7 (708).

Independent claim 61 is directed to apparatus to provide satellite positioning system (SPS) signal processing. The apparatus of claim 61 comprises a combination of elements, including "means for removing pseudorandom noise from one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal" as described at paragraph 21 with reference to Fig 1 (106), paragraph 56 with reference to Fig. 4 (406), paragraph 66 with reference to Fig. 5 (506), paragraph 74 with reference to Fig. 6 (612, 614), and paragraph 76 with reference to Fig. 7 (708). Claim 61 also comprises "means for combining common information in said first portion with said second portion to improve the sensitivity of the SPS receiver" as described at as described at paragraph 18, paragraph 20 with reference to Fig. 1 (104), paragraphs 69-70 with reference to Fig. 5 (514-516), paragraph 74 with reference to Fig. 6 (612, 614), and paragraph 76 with reference to Fig. 7 (708).

Finally, claim 61 states that "said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals" as described at paragraph 18, paragraphs 22-24 with reference to Fig. 1 (108), paragraphs 57-58 with reference to Fig. 4 (408-410), paragraphs 65-66 and 68-70 with reference to Fig. 5 (512-516), paragraph 74 with reference to Fig. 6 (612, 614), and paragraph 76 with reference to Fig. 7 (708).

Independent claim 68 is directed to an apparatus to provide satellite positioning system (SPS) signal processing. The apparatus of claim 68 comprises a combination of elements, including "a correlator, said correlator receiving one or more SPS signals" as described at paragraph 74 with reference to Fig. 6 (612). Claim 68 also recites "a navigation computer coupled to the correlator, said navigation computer removing pseudorandom noise from said one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal, said navigation computer combining common information in said first portion with said second portion to improve the sensitivity of the SPS receiver" as described at paragraph 74 with reference to Fig. 6 (614). Finally, claim 68 states that "said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals" as described at as described at paragraph 18, paragraphs 22-24 with reference to Fig. 1 (108), paragraphs 57-58 with reference to Fig. 4 (408-410), paragraphs 65-66 and 68-70 with reference to Fig. 5 (512-516), and paragraph 74 with reference to Fig. 6 (612, 614).

Independent claim 75 is directed to an apparatus to provide satellite positioning system (SPS) signal processing. The apparatus of claim 75 includes a combination of elements including "means for receiving at an SPS receiver one or more SPS signals" as described at paragraph 74 with reference to Fig. 6 (602), and paragraph 76 with reference to Fig. 7 (702). The apparatus of claim 75 also includes "means for removing pseudorandom noise from said one or more SPS

signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal" paragraph 74 with reference to Fig. 6 (612, 614), and paragraph 76 with reference to Fig. 7 (708). Claim 75 further recites "means for combining said first portion with said second portion to improve the sensitivity of the SPS receiver" paragraph 74 with reference to Fig. 6 (614), and paragraph 76 with reference to Fig. 7 (708). Finally, claim 75 recites that "said first portion and said second portion contain common information in said one or more SPS signals" as described at as described at paragraph 18, paragraphs 22-24 with reference to Fig. 1 (108), paragraphs 57-58 with reference to Fig. 4 (408-410), paragraphs 65-66 and 68-70 with reference to Fig. 5 (512-516), and paragraph 74 with reference to Fig. 6 (612, 614).

Issues

The issues presented by the present appeal are:

Whether the Examiner erred in rejecting claims 1-3, 5-17, 20-29, 31, 34-39, 43-61, 65-68, 71-75, and 79-84 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,640,452 to Murphy (hereinafter referred to as "Murphy") in view of Japanese Patent No. JP09218038A to Timo Alison et al. (hereinafter referred to as "Alison").

Whether the Examiner erred in rejecting claims 1-3, 5-17, 20-29, 31, 34-39, 43-61, 65-68, 71-75, and 79-84 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,963,582 to Stansell, Jr. (hereinafter referred to as "Stansell I") or U.S. Patent No. 6,160,841 to Stansell, Jr. et al. (hereinafter referred to as "Stansell II") in view of Alison.

Whether the Examiner erred in rejecting claims 4, 18, 30, 31, 33, 40-41, 62-63, 69-70, 76, and 77-78 under 35 U.S.C. § 103(a) as being unpatentable over Murphy, Stansell I or Stansell II in view of Alison and further in view of U.S. Patent No. 6,108,317 to Jones et al. (hereinafter referred to as "Jones").

Argument

A. Grouping of Claims

The patentability of independent claims 1, 16, 29, 43, 61, 68, and 75 will be argued together.

B. Summary of the Examiner's Final Rejection

The Examiner rejected claims 1-3, 5-17, 20-29, 31, 34-39, 43-61, 65-68, 71-75, and 79-84 under 35 U.S.C. § 103(a) as being unpatentable over Murphy in view of Alison. The Examiner also rejected claims 1-3, 5-17, 20-29, 31, 34-39, 43-61, 65-68, 71-75, and 79-84 under 35 U.S.C. § 103(a) as being unpatentable over Stansell I or Stansell II in view of Alison.

In particular, the Examiner rejected the claims, asserting that Murphy discloses all of the subject matter claimed with the exception of common information, according to paragraph 3 of the final Office Action. The Examiner recognizes that Murphy does not disclose common information, and asserts that Alison teaches such common information, stating that this reference "teaches the use of common information comprises [sic] data that is concurrently contained in more than one of the received SPS signals...." According to the Examiner, it would have been obvious to combine common information asserted to be disclosed by Alison into SPS signal processing as disclosed by Murphy in order to have more accurate position determination. In response to the Appellant's arguments that neither Alison nor Murphy disclose common information as claimed, the Examiner at paragraph 12 of the final Office Action asserts that Alison discloses such information as "is clearly seen in the abstract and drawings by a glance review." The Examiner states that predetermined survey marks, and predetermined positional coordinates of the mobile receiver and processor, are examples of common information data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals.

The Examiner also rejected claims 1-3, 5-17, 20-29, 31, 34-39, 43-61, 65-68, 71-75, and 79-84 under 35 U.S.C. § 103(a) as being unpatentable over Stansell I or Stansell II in view of Alison.

In particular, the Examiner rejected the claims, asserting that Stansell I or Stansell II disclose all of the claimed subject matter except for common information that comprises data that is concurrently contained in more than one of the received signals, according to paragraph 4 of the final Office Action. The Examiner then relies on Alison as disclosing such common information as described above with reference to the rejection based on Murphy. According to the Examiner, it would have been obvious to combine the common information asserted to be disclosed in Alison into SPS signal processing as disclosed by Stansell I or Stansell II in order to have more accurate position determination.

The Examiner also rejected claims 4, 18, 30, 31, 33, 40-41, 62-63, 69-70, 76, and 77-78 under 35 U.S.C. § 103(a) as allegedly unpatentable over Murphy, Stansell I or Stansell II in view of Alison and further in view Jones. The Examiner did not provide any discussion of this rejection in the final Office Action.

C. Summary of the References Cited by the Examiner

United States Patent No. 5,640,452 to Murphy

Murphy is directed to a decryption chip that is used for decrypting an encrypted signal, as described in the Abstract and at col. 6, lines 41-57. The encrypted signal may include any data that is desired to be protected from unauthorized reception, and Murphy discloses, at col. 1, lines 10-19, that a significant problem with such decryption chips is cloning of the chip, thus allowing unauthorized parties to receive and decrypt the signals. In order to reduce piracy from cloned decryption chips, Murphy discloses the incorporation of a satellite positioning system (SPS) in a decryption module, with the decryption chip being disabled in the event that the SPS indicates that the chip is not within a predefined radius of an expected location, as indicated at col. 6, line

65, through col. 7, line 6. Murphy provides an example illustrated in Fig. 1 and described at col.7, line 22, through col. 8, line 37. In the provided example, a licensed site may be authorized to receive and decrypt an encrypted signal, and the location of the site is programmed into the decryption chip. In the event that the chip is not within a preset radius of the site location, the chip is deactivated and the encrypted signal is not decrypted, but rather a notification signal is transmitted.

Thus, the SPS of Murphy is used to reduce piracy resulting from cloned decryption chips. With respect to processing of SPS signals, Murphy discloses at col. 10, line 32, through col. 12, line 10, the well known signals transmitted by satellites in SPS systems, and processing of such signals to determine position of the decryption module. Once the location of the decryption module is determined, this position is compared to an expected position, and the decryption chip is enabled or disabled based on the comparison.

Japanese Patent No. JP09218038A to Timo Alison et al.

Alison discloses a surveying system that relies on multiple SPS receivers to accurately determine the location of surveying marks. A reference receiver is placed at a known fixed coordinate position, and positional coordinates of the reference receiver are used to assist with the determination of positional information of a mobile receiver. As mentioned on the second page of the Alison abstract, enhanced accuracy is achieved through differential positioning. Differential positioning is accomplished by comparing a position determined by satellite signals received at the reference receiver with the known position of the reference receiver. A processor then determines difference signals between the expected SPS based on the known position and the SPS signals actually receive. The difference signals are provided to the mobile receiver to reduce position inaccuracies in the mobile receiver. Thus, Alison uses the known position of a reference receiver to determine a correction for a mobile receiver.

The Stansell References

Stansell I and Stansell II contain common specifications and drawings, and are therefore discussed together. Stansell I and Stansell II and are directed to mitigation of multipath effects in GPS receivers, according to the abstract. As described at col. 14, line 60, through col. 16, line 43, multipath effects are mitigated by deriving phase error signals and code error signals that are each generated based on differences between received pseudorandom noise (PN) signals and signals that are generated at the GPS receiver. The error signals are then analyzed to reduce effect of multipath in the received signals. Thus, Stansell I and Stansell II perform correlation based on received PN signals, which is necessarily done prior to removing PN from the received signals.

United States Patent No. 6,108,317 to Jones et al.

Jones is directed to a system for satellite based telephony transmission. As described at col. 4, lines 33-51, telephony is achieved transmitting a cyclic code phase multiple access spread-spectrum communications signal between a satellite terminal and a hub. Transmissions are spread using sequences that are assigned from a set of cyclically related PN sequences in order to provide multiple access. As Jones is directed to communications, there is no disclosure of positioning, or of received satellite positioning system signals.

D. The standard for establishing *prima facie* obviousness

As is well established, in order to establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. See MPEP §2143, citing In re Royka 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Furthermore, in rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a *prima facie* case of obviousness. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Only if that burden is met, does the burden of coming forward with evidence or argument shift to the applicant. Id. The burden is on the examiner to provide a reason, based on the prior art, or knowledge generally available in the art as to why it would have been obvious to one of ordinary skill in the art to arrive at the claimed invention. See Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297, n.24, 227 USPQ 657, 667, n.24 (Fed. Cir. 1985). If the examiner fails to establish a *prima facie* case, the rejection is improper. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir.1988).

E. The rejection based on Murphy and Alison

The Examiner has not established *prima facie* obviousness

Appellant submits that the Examiner has not established *prima facie* obviousness of the independent claims. The Examiner asserts that Murphy discloses the claimed subject matter with the exception of common information. As explained above, Murphy is directed to verifying the location of a decryption chip using traditional SPS positioning techniques. Murphy does not contemplate combining a first portion of a narrowband signal with common information in a second portion of a narrowband signal to improve sensitivity of an SPS receiver. At no point does Murphy disclose processing SPS signals to obtain a first portion of a narrowband signal and a second portion or a narrowband signal, and combining said first portion with common information in said second portion to improve the sensitivity of the SPS receiver; wherein said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals, as required by claim 1. The Examiner recognizes that Murphy does not disclose common information as claimed, are asserts that Alison provides such disclosure.

Alison does not correct the deficiencies of Murphy. Alison, as described above, is directed to differential positioning and uses the known position of a reference receiver to determine a correction for a mobile receiver. Appellant

respectfully submits that Alison contains no disclosure of common information comprising data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals. Neither the English language abstract of Alison, nor the drawing figures, provide any description of common information contained in a narrowband signal. In fact, the portions of Alison cited by the Examiner do not provide any disclosure of narrowband signals at all, and therefore cannot disclose common information as claimed. Alison, therefore, is also devoid of any teaching or suggestion of combining a first portion of a narrowband signal with *common information* in a second portion of a narrowband signal to improve the sensitivity of an SPS receiver. Accordingly, the Examiner has not established *prima facie* obviousness.

The Examiner asserts at paragraph 12 of the final Office Action that Alison discloses common information in the form of a predetermined survey mark and predetermined positional coordinates of the mobile receiver and processor. Appellant respectfully submits that, even if such information is used in position determination, such information is different than common information as claimed. As discussed above, claim 1 requires that "said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals." As described above, Alison contains no disclosure of such common information. Unlike the claimed common information, the Alison predetermined survey mark and/or positional coordinates for the mobile receiver are not included in SPS signals at all. Because the information of Alison is not included in SPS signals, such information also cannot be either repeated in time within the same received SPS signal or concurrently contained in more than one of the received SPS signals.

It is thus submitted that the cited references, taken alone or in combination, are devoid of any teaching or suggestion of combining common information from different portions of a signal to improve the sensitivity of an

SPS receiver, wherein the common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals. Therefore, it is submitted that the Examiner has not established *prima facie* obviousness of independent claim 1 for at least the reason that the cited references, taken alone or in combination, fail to teach or suggest common information, or combining common information to improve sensitivity of an SPS receiver, as claimed. It is thus submitted that the Examiner's rejections should be reversed.

Independent claims 16, 29, 43, 61, 66, 68, and 75 contain similar limitations as described with respect to the common information of claim 1. It is also submitted that the Examiner has not established *prima facie* obviousness of these claims for at least the same reasons as described with respect to claim 1. Similarly, the references of record do not render dependent claims 2-3, 5,15, 17, 20-28, 31, 34-39, 44-60, 65, 67, 71-74, and 79-84 obvious at least because these claims contain the elements of respective independent claims from which they depend. It is thus submitted that the Examiner's rejections should be reversed.

F. The rejection based on Stansell I or Stansell II and Alison

The Examiner has not established *prima facie* obviousness

Appellant submits that the Examiner has not established *prima facie* obviousness of the independent claims. The Examiner cites Stansell I and Stansell II as teaching all of the claimed subject matter claimed except for common information. As explained above, Stansell I and Stansell II are directed to reducing multipath effects by correlating received PN sequences with generated sequences and reducing error. Stansell I and Stansell II perform processing on the PN signal directly, and contain no disclosure of processing SPS signals to obtain a first portion of a narrowband signal and a second portion or a narrowband signal, and combining said first portion with common information in said second portion to improve the sensitivity of the SPS receiver; wherein said common information comprises data that is either repeated in time within the

same received SPS signal or that is concurrently contained in more than one of the received SPS signals, as required by claim 1. The Examiner, similarly as with Murphy, recognizes that Stansell I and Stansell II do not disclose common information as claimed, and goes on to assert that Alison discloses common information.

Alison does not correct the deficiencies of Stansell I or Stansell II. Alison, as described above, is directed to differential positioning and uses the known position of a reference receiver to determine a correction for a mobile receiver. Appellant respectfully submits that Alison contains no disclosure of common information comprising data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals. Neither the English language abstract of Alison, nor the drawing figures, provide any description of common information contained in a narrowband signal. In fact, the portions of Alison cited by the Examiner do not provide any disclosure of narrowband signals at all, and therefore cannot disclose common information as claimed. Alison, therefore, is also devoid of any teaching or suggestion of combining a first portion of a narrowband signal with *common information* in a second portion of a narrowband signal to improve the sensitivity of an SPS receiver. Accordingly, the Examiner has not established *prima facie* obviousness.

The Examiner asserts at paragraph 12 of the final Office Action that Alison discloses common information in the form of a predetermined survey mark and predetermined positional coordinates of the mobile receiver and processor. Appellant respectfully submits that, even if such information is used in position determination, such information is different than common information as claimed. As discussed above, claim 1 requires that "said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals." As described above, Alison contains no disclosure of such common information. Unlike the claimed common information, the Alison predetermined survey mark

and/or positional coordinates for the mobile receiver are not included in SPS signals at all. Because the information of Alison is not included in SPS signals, such information also cannot be repeated in time within the same received SPS signal or concurrently contained in more than one of the received SPS signals.

It is thus submitted that the cited references, taken alone or in combination, are devoid of any teaching or suggestion of combining common information from different portions of a signal to improve the sensitivity of an SPS receiver, wherein the common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals. Therefore, it is submitted that the Examiner has not established *prima facie* obviousness of independent claim 1 for at least the reason that the cited references, taken alone or in combination, fail to teach or suggest common information, or combining common information to improve sensitivity of an SPS receiver, as claimed. It is thus submitted that the Examiner's rejections should be reversed.

Independent claims 16, 29, 43, 61, 66, 68, and 75 contain similar limitations as described with respect to the common information of claim 1. It is also submitted that the Examiner has not established *prima facie* obviousness of these claims for at least the same reasons as described with respect to claim 1. Similarly, the references of record do not render dependent claims 2-3, 5,15, 17, 20-28, 31, 34-39, 44-60, 65, 67, 71-74, and 79-84 obvious at least because these claims contain the elements of respective independent claims from which they depend. It is thus submitted that the Examiner's rejections should be reversed.

G. The rejection of dependent claims based on Murphy, Stansell I or Stansell II, Alison, and Jones

The Examiner has not established *prima facie* obviousness

Appellant submits that the Examiner has not established *prima facie* obviousness of dependent claims 2-3, 5,15, 17, 20-28, 31, 34-39, 44-60, 65, 67, 71-74, and 79-84. Murphy, Stansell I and Stansell II, and Alison were discussed

above with respect to the independent claims. Jones does not correct the deficiencies of Murphy, Stansell I or Stansell II, or Alison. Jones, as described above, is directed to telephony where multiple access is provided using a sequence spreading technique. Appellant respectfully submits that Jones contains no disclosure of common information comprising data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals.

It is thus submitted that the references of record do not render dependent claims 2-3, 5,15, 17, 20-28, 31, 34-39, 44-60, 65, 67, 71-74, and 79-84 obvious at least because these claims contain the elements of respective independent claims from which they depend, and Jones does not correct the deficiencies of the references cited against the independent claims. It is thus submitted that the Examiner's rejections should be reversed.

Request:

Reversal of the Examiner's final rejection of claims 1-84 is respectfully requested for the above-stated reasons.

Respectfully submitted,

Dated: March 19, 2007

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APPENDIX

Claims 1-84 involved in this Appeal read as follows:

1. A method for satellite positioning system (SPS) signal processing, said method comprising:

receiving at an SPS receiver one or more SPS signals;

removing pseudorandom noise from said one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal;

combining said first portion with common information in said second portion to improve the sensitivity of the SPS receiver;

wherein said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals.

2. The method of claim 1, wherein said combining of said first portion with said second portion follows a differential demodulation of said one or more SPS signals.

3. The method of claim 2, wherein said combining of said first portion with said second portion includes summing said first and second portions following said differential demodulation.

4. The method of claim 2 wherein said differential demodulation combines pairs of signal samples contained with said one or more SPS signals which are separated in time from one another by a multiple of a bit period of data contained within said one or more SPS signals.

5. The method of claim 1, further comprising:

determining data bits representative of navigational information embedded in one of said first and said second portions from said combining.

6. The method of claim 5, wherein said navigational information comprises satellite ephemeris information and wherein said common information comprises identical information in said first and said second portions.

7. The method of claim 5, wherein said navigational information comprises error correction information.

8. The method of claim 5, wherein said navigational information comprises a position of said SPS receiver.

9. The method of claim 5, wherein said navigational information comprises a position of an entity.

10. The method of claim 1, wherein said SPS receiver comprises a Global Positioning Satellite (GPS) receiver.

11. The method of claim 10, wherein said mobile GPS receiver comprises communication circuitry.

12. The method of claim 1, wherein said first and second portions are separated in time by a duration equal to a multiple of a frame period of an SPS message.

13. The method of claim 1, wherein said first portion is associated with a first satellite vehicle message, and said second portion is associated with a second satellite vehicle message.

14. The method of claim 1, wherein said first and second portions are associated with exactly one satellite vehicle message.

15. The method of claim 1, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.

16. A method for processing a signal associated with a satellite positioning system, said method comprising:

receiving at an SPS receiver a first SPS signal containing a satellite message associated with a satellite vehicle;

receiving at said SPS receiver a second SPS signal containing said satellite message associated with said satellite vehicle;

removing pseudorandom noise from said first and second SPS signals to provide a first set of signal samples of a narrowband signal and a second set of signal samples of a narrowband signal;

combining common information in said first and second sets of signal samples to improve the sensitivity of the SPS receiver;

wherein said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals.

17. The method of claim 16, wherein said combining of said first and second sets of signal samples follows a differential demodulation of said first and second SPS signals.

18. The method of claim 17, wherein said combining of said first and second sets of signal samples includes summing said first and second sets of signal samples following said differential demodulation.

19. The method of claim 17, wherein said differential demodulation combines pairs of said first and second SPS signals separated in time from one another by a multiple of a bit period of data contained within said first and second SPS signals.

20. The method of claim 16, further comprising:
determining data bits representative of navigational information embedded in one of said first and said second sets from said combining.

21. The method of claim 20, wherein said navigational information comprises satellite ephemeris information.

22. The method of claim 20, wherein said navigational information comprises error correction information.

23. The method of claim 20, wherein said navigational information comprises a position of said SPS receiver.

24. The method of claim 20, wherein said navigational information comprises a position of an entity.

25. The method of claim 16, wherein said SPS receiver comprises a Global Positioning Satellite (GPS) receiver.

26. The method of claim 25, wherein said mobile GPS receiver comprises communication circuitry.

27. The method of claim 16, wherein said first and second sets of signal samples are separated in time by a multiple of the duration of the frames of said satellite message.

28. The method of claim 16, wherein said common information comprises a repetition of a portion of said satellite message.

29. A method for satellite positioning system signal processing, said method comprising:

receiving at an SPS receiver a first SPS signal containing a first satellite message, said first satellite message associated with a first satellite vehicle;

receiving at said SPS receiver a second SPS signal containing a second satellite message, said second satellite message associated with a second satellite vehicle;

removing pseudorandom noise from said first and second SPS signals to provide a first set of signal samples of a narrowband signal and a second set of signal samples of a narrowband signal;

combining common information in said first and second sets of signal samples to improve the sensitivity of the SPS receiver;

wherein said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals.

30. The method of claim 29, wherein said combining of said first and second sets of signal samples follows a differential demodulation of said first and second SPS signals.

31. The method of claim 30, wherein said combining of said first and second sets of signal samples includes summing said first and second sets of signal samples following said differential demodulation.

32. The method of claim 30, wherein said combining of said first and second sets of signal samples includes a weighted summation of said first and second sets of signal samples, wherein weighting associated with said weighted

summation depends on a signal-to-noise ratio (SNR) of at least one of said first and second sets of signal samples.

33. The method of claim 30, wherein said differential demodulation combines pairs of said first and second SPS signals separated in time from one another by a multiple of a bit period of data contained within said first and second SPS signals.

34. The method of claim 29, further comprising:
determining data bits representative of navigational information from said combining.

35. The method of claim 34, wherein said navigational information comprises satellite time-of-week (TOW) information.

36. The method of claim 34, wherein said navigational information comprises satellite Almanac information.

37. The method of claim 34, wherein said navigational information comprises a position of said SPS receiver.

38. The method of claim 34, wherein said navigational information comprises a position of an entity.

39. The method of claim 29, wherein said SPS receiver comprises a mobile Global Positioning Satellite (GPS) receiver.

40. The method of claim 39, wherein said mobile GPS receiver comprises communication circuitry.

41. The method of claim 27, wherein said first and second results comprise time-of-week (TOW) information.

42. The method of claim 41, wherein comparing said first and second results comprises determining a difference between TOW as indicated by said first and second results, and comparing said difference to a value representing a time difference between said first and second results.

43. An apparatus to provide satellite positioning system (SPS) signal processing, said apparatus comprising:

a despreader that removes pseudorandom noise from one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal;

a processor, coupled to said despreader, to combine common information in said first portion with said second portion to improve the sensitivity of the SPS receiver said common information comprising data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals.

44. The apparatus of claim 43, wherein said despreader comprises:

a differential demodulation unit to differentially demodulate said first and second portions; and

wherein said processor comprises

a summing unit, coupled to said differential demodulation unit, to sum said first and second portions.

45. The apparatus of claim 43, wherein said processor sums said first and second portions after said processor differentially demodulates said first and second portions.

46. The apparatus of claim 43, wherein said processor adds in a summing operation said first portion with said second portion following a differentially demodulating operation, and wherein said summing operation comprises including a weighting factor, said weighting factor being a function of a signal-to-noise ratio (SNR).

47. The apparatus of claim 43, wherein said apparatus comprises a mobile Global Positioning Satellite (GPS) receiver.

48. The apparatus of claim 47, wherein said mobile GPS receiver further comprises communication circuitry.

49. The apparatus of claim 43, wherein said first and second portions are separated in time by a duration equal to a multiple of a frame period of said satellite message.

50. The apparatus of claim 43, wherein said first portion is associated with a first satellite vehicle message, and said second portion is associated with a second satellite vehicle message.

51. The apparatus of claim 43, wherein said first and second portions are associated with exactly one satellite vehicle message.

52. The apparatus of claim 48, wherein a remote entity is accessible by said mobile GPS receiver via said communication circuitry.

53. The apparatus of claim 52, wherein said remote entity comprises a basestation.

54. The apparatus of claim 53, wherein said basestation comprises a communication link to a data processing network.

55. The apparatus of claim 43, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.

56. The apparatus of claim 43, wherein said processor determines data bits representative of navigational information embedded in one of said first and said second portions from combining said first portion with said second portion.

57. The apparatus of claim 56, wherein said navigational information comprises satellite ephemeris information.

58. The apparatus of claim 56, wherein said navigational information comprises error correction information.

59. The apparatus of claim 56, wherein said navigational information comprises a position of an SPS receiver.

60. The apparatus of claim 56, wherein said navigational information comprises time-of-week (TOW) information.

61. An apparatus to provide satellite positioning system (SPS) signal processing, said apparatus comprising:

means for removing pseudorandom noise from one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal; and

means for combining common information in said first portion with said second portion to improve the sensitivity of the SPS receiver;

wherein said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals.

62. The apparatus of claim 61, wherein said means for removing pseudorandom noise comprises:

a differential demodulation unit to differentially demodulate said first and second portions; and

wherein said means for combining comprises:

a summing unit, coupled to said differential demodulation unit, to sum said first and second portions.

63. The apparatus of claim 62, wherein said differential demodulation unit and said summing unit are included in a processor.

64. The apparatus of claim 61, wherein said means for combining adds in a summing operation said first portion with said second portion following a differentially demodulating operation, and wherein said summing operation comprises including a weighting factor, said weighting factor being a function of a signal-to-noise ratio (SNR).

65. The apparatus of claim 61, further comprising:

means for determining data bits representative of navigational information embedded in one of said first and said second portions from combining said first portion with said second portion.

66. The apparatus of claim 65, wherein said navigational information comprises at least one of:

a) satellite ephemeris information;

b) error correction information;

c) a position of an SPS receiver;

d) a position of an entity;

e) time-of-week (TOW) information; and

f) satellite Almanac information.

67. The apparatus of claim 61, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.

68. An apparatus to provide satellite positioning system (SPS) signal processing, said apparatus comprising:

a correlator, said correlator receiving one or more SPS signals; and

a navigation computer coupled to the correlator, said navigation computer removing pseudorandom noise from said one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal, said navigation computer combining common information in said first portion with said second portion to improve the sensitivity of the SPS receiver;

wherein said common information comprises data that is either repeated in time within the same received SPS signal or that is concurrently contained in more than one of the received SPS signals.

69. The apparatus of claim 68, wherein said navigation computer combines said first portion with said second portion follows a differential demodulation of said one or more SPS signals.

70. The apparatus of claim 68, wherein said navigation computer sums said first and second portions after said navigation computer differentially demodulates said first and second portions.

71. The apparatus of claim 68, wherein said navigation computer adds in a summing operation said first portion with said second portion following a

differentially demodulating operation, and wherein said summing operation comprises including a weighting factor, said weighting factor being a function of a signal-to-noise ratio (SNR).

72. The apparatus of claim 68, wherein said navigation computer determines data bits representative of navigational information embedded in one of said first and said second portions from combining said first portion with said second portion.

73. The apparatus of claim 72, wherein said navigational information comprises at least one of:

a) satellite ephemeris information;

b) error correction information;

c) a position of an SPS receiver;

d) a position of an entity;

e) time-of-week (TOW) information; and

f) satellite Almanac information.

74. The apparatus of claim 68, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.

75. An apparatus to provide satellite positioning system (SPS) signal processing, said apparatus comprising:

means for receiving at an SPS receiver one or more SPS signals;

means for removing pseudorandom noise from said one or more SPS signals to provide a first portion of a narrowband signal and a second portion of a narrowband signal;

means for combining said first portion with said second portion to improve the sensitivity of the SPS receiver;

wherein said first portion and said second portion contain common information in said one or more SPS signals.

76. The apparatus of claim 75, wherein said means for combining combines said first portion with said second portion follows a differential demodulation of said one or more SPS signals.

77. The apparatus of claim 76, wherein said means for combining sums said first and second portions following said differential demodulation.

78. The apparatus of claim 76, wherein said differential demodulation combines pairs of signal samples contained with said one or more SPS signals which are separated in time from one another by a multiple of a bit period of data contained within said one or more SPS signals.

79. The apparatus of claim 75, further comprising:

means for determining data bits representative of navigational information embedded in one of said first and said second portions from said combining.

80. The apparatus of claim 79, wherein said navigational information comprises at least one of:

a) satellite ephemeris information;

b) error correction information;

c) a position of an SPS receiver;

d) a position of an entity;

e) time-of-week (TOW) information; and

f) satellite Almanac information.

81. The apparatus of claim 75, wherein said first and second portions are separated in time by a duration equal to a multiple of a frame period of an SPS message.

82. The apparatus of claim 75, wherein said first portion is associated with a first satellite vehicle, and said second portion is associated with a second satellite vehicle.

83. The apparatus of claim 75, wherein said first and second portions are associated with exactly one satellite vehicle message.

84. The apparatus of claim 75, wherein said common information comprises a repetition of a portion of a satellite message from one SPS satellite.